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The Changing US Pork Industry and Implications for Future Growth

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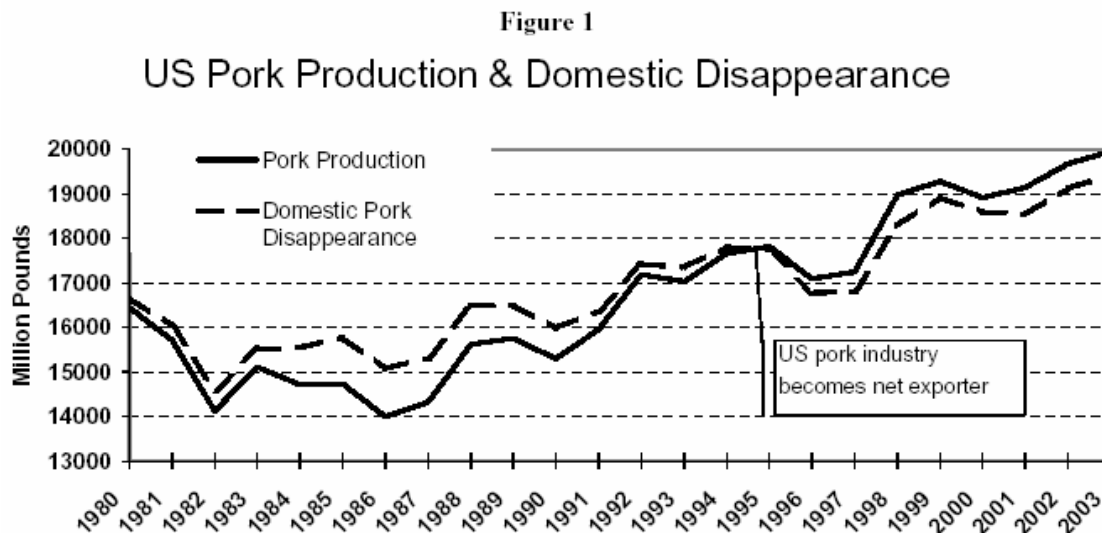
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The Changing US Pork Industry and Implications for Future Growth

In the past 25 years, the US pork industry has undergone a dramatic transformation in response to pressures to compete, both in the domestic market against competing proteins and in the export market against the pork industries of other countries. Although the process of restructuring is ongoing, and the merits of this industry restructuring are still debated in some quarters, the net result is that the US pork industry has held its ground domestically and has made major inroads in export markets. The United States has generally strengthened its position as one of the most competitive pork industries in the world, but the industry still faces challenges both from other meats and against competing nations such as Canada and Brazil.

Pork Markets

US domestic pork disappearance (i.e. total consumption) hit an historic low in 1982 but has since trended higher (Figure 1), reflecting fairly stable per capita consumption coupled with US population growth. Over the same period, domestic pork production has increased at an even faster rate, (interrupted only by the normal fluctuations of the US hog cycle) allowing the United States to become a net exporter of pork products and one of the preeminent suppliers on world markets.



Over the past several decades, US meat consumption (beef, pork and poultry combined) has shown steady growth, from about 150 lbs per capita in 1960 to nearly 225 lbs per capita in 2004 (Figure 2). This reflects both US income growth and improved production techniques that have generally resulted in lower unit prices and improved quality characteristics. But domestic consumption of pork has been remarkably stable over the same period, mostly remaining between 50 lbs and 60 lbs per capita, but closer to 50 lbs per capita since about 1982. On the other hand, per capita beef and chicken consumption have trended in opposite directions, with strong growth

in poultry offsetting steady, slow erosion in beef consumption over most of the same period (Figure 3). And, price changes alone cannot explain most of these consumption trends, as beef consumption has trended lower despite steady or modestly declining real prices of beef over much of this period, while consumption of chicken has shown almost consistent year-over-year increases regardless of price fluctuations. Hence, other factors such as health perceptions, quality and consistency, convenience of preparation, and marketing/branding strategies have contributed to changing consumption patterns among major meat groups. Pork demand has shown remarkable stability against these market dynamics.

Figure 2
US MEAT CONSUMPTION
Annual, Pounds Per Capita, Ret. Weight

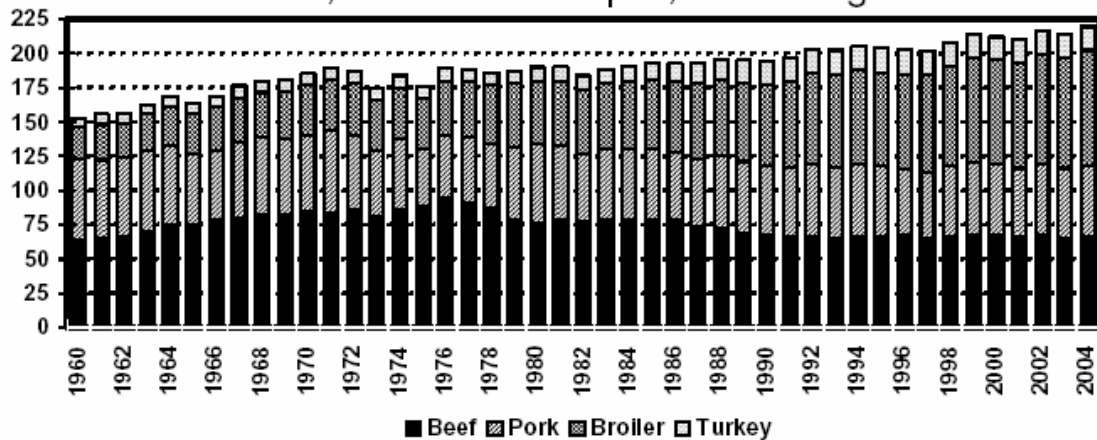
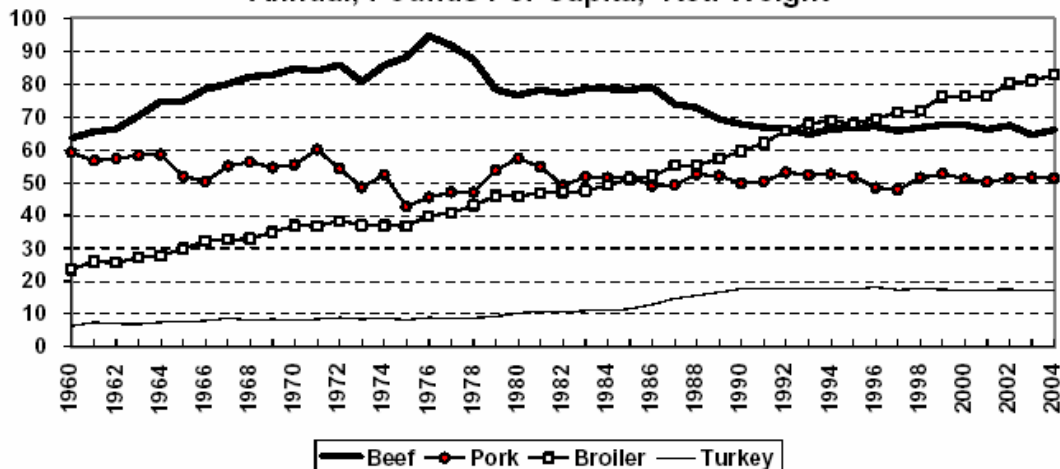


Figure 3
US MEAT CONSUMPTION
Annual, Pounds Per Capita, Ret. Weight

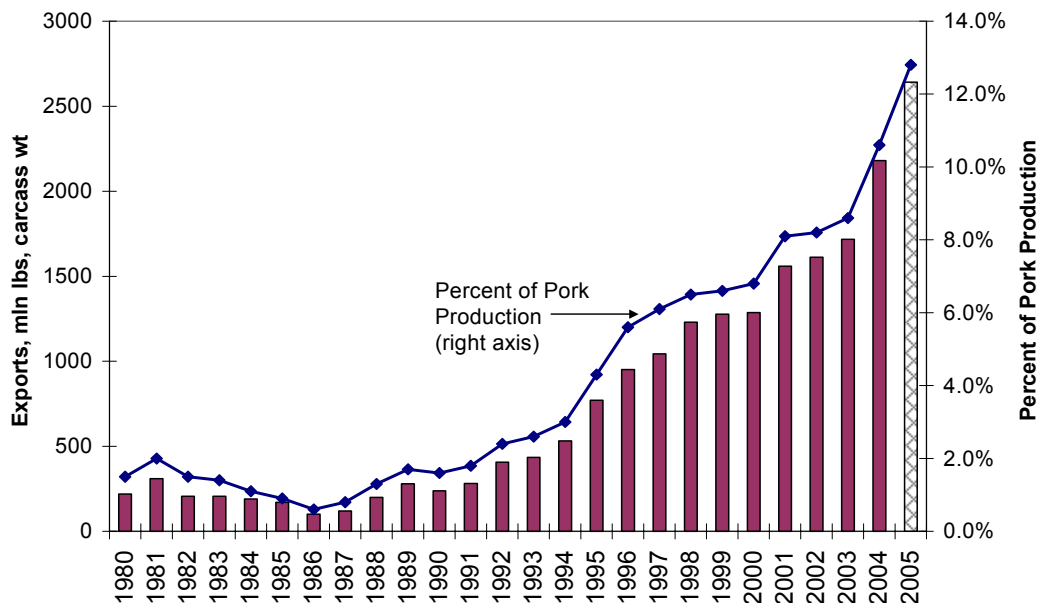


Historic consumption patterns indicate that the US consumer is willing to consume up to about 53 lbs of pork per capita within the current price range, so expanding demand beyond that level is mostly uncharted territory. This suggests that continued industry growth is likely to come mostly through domestic population growth and exports, along with some “targeted” growth in niche

markets that appeal to particular consumer interests, such as perhaps, organic production, heirloom genetics, or production systems that emphasize specific traits such as antibiotic free, animal welfare concerns, or others.

The ability to expand exports has been one of the pork industry's greatest success stories, and export growth occurred alongside a period of rapid industry restructuring that is still underway. Only in 1992, after the process of industry restructuring was well established, did US pork exports exceed 2% of output for the first time in our era. Between 1994 and 1998 the volume of exports tripled, as new plants using new genetics made rapid inroads into the Japanese market in particular. 1995 was a watershed year, with US pork exports exceeding imports for the first time since at least 1980 and probably back to WWII. Since that time, the US pork industry has maintained its status as a net pork exporter. Following a sideways trend in exports in 1999 and 2000, trade shot higher again the next four years, with exports reaching 10% of pork production in 2004 and likely to finish above 12% of output for 2005 (Figure 4). From 1990 to 2004, the US pork industry has maintained a trend of increasing annual pork exports for 14 consecutive years, with 2005 expected to continue this trend. More than any other single factor, this trend provides strong evidence of the global competitiveness of the US pork industry.

Figure 4
Total US Pork Exports
and % of Pork Production



Of course the US is not the only country that is interested in and capable of exporting pork. Key export markets, in particular Japan, have been and will remain strongly contested in the years to come. During the late 1990's, key competitors Canada and Denmark were also growing their pork exports at a strong pace, with volumes very similar to US exports. Since 2000, Canada has emerged as the top pork exporting nation, if Denmark's shipments to other EU countries are excluded. Since 1999, Denmark's exports outside the EU have leveled, reflecting better opportunities within the EU and reduced competitiveness outside the common market. Interestingly, if trade between the two countries is excluded, Canada and the US currently export an almost identical volume of pork to third countries (Figure 5).

In the same period, a new power in world pork trade has emerged in Brazil. However, to this point, Brazil's foot and mouth disease status has prevented it from competing in the critical Japanese market, with Russia the main customer of Brazilian pork so far. In this highly competitive trade environment, one US advantage is an efficient well-integrated pork production system, with relatively low cost hog production complemented by a high volume, highly efficient processing sector. As one indication of the degree of competition in export markets, Figure 6 shows the US share of Japanese pork imports over time. Large gains were made after favored supplier Taiwan suffered a foot and mouth disease outbreak in 1997. Since then, US exporters have maintained a roughly one-third market share in this critical pork market.

Figure 5
Major Pork Exporters

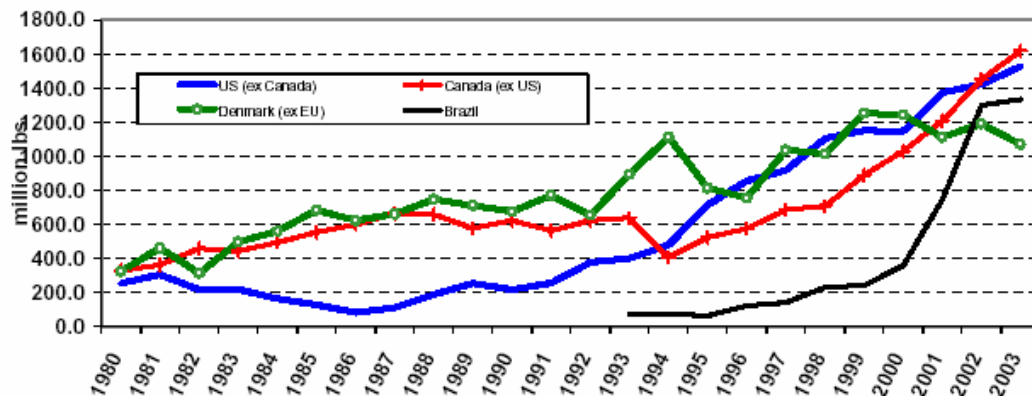
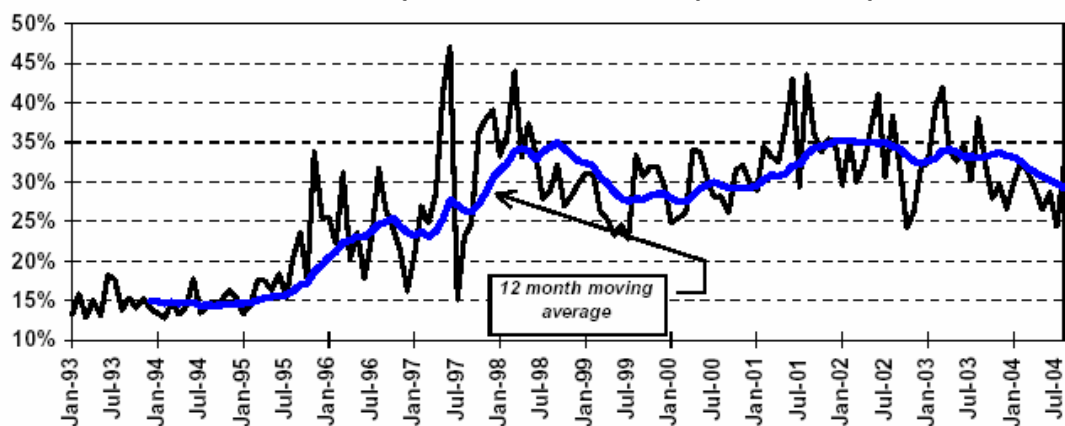


Figure 6
US Pork Exports as a % of Japanese Imports



Packing Industry Consolidation

Competitive pressures have completely transformed the US pork packing industry and promise additional changes in the years to come. Since 1980 the industry has been restructured from a highly fragmented sector with dozens of small to medium sized companies to a sector dominated by six multi-plant firms and another five firms with large single slaughter plants (Table 1). The

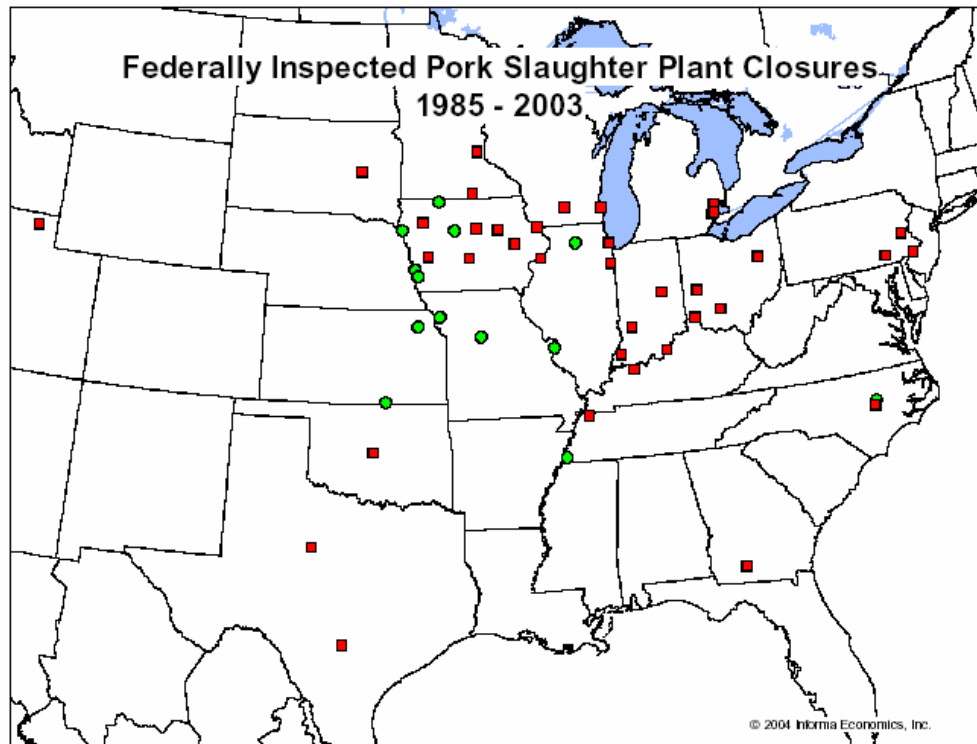
largest firm, Smithfield, now accounts for nearly 30% of US market share with eight slaughter facilities, including the world's largest single slaughter operation. The top four operations control about 65% of total slaughter capacity, compared to 55% ten years ago.

Table 1

US PORK PACKERS		Estimated Daily Capacities by Company									
Company	End of 1994	End of 1995	End of 1996	End of 1997	End of 1998	End of 1999	End of 2000	End of 2001	End of 2002	End of 2003	End of 2004
Smithfield	35,300	73,800	81,800	78,000	78,000	78,000	78,000	78,000	79,500	108,100	111,650
Tyson (IBP)	63,900	70,900	78,400	66,200	66,200	66,200	66,200	66,200	71,000	69,500	72,100
Swift	38,500	38,500	38,500	38,500	39,400	39,400	39,400	39,400	42,000	44,000	46,000
Excel j/	25,600	32,600	38,000	38,000	38,000	38,000	38,000	35,600	32,000	32,000	36,000
Hormel h/	36,700	26,000	29,000	29,000	30,000	32,500	32,500	30,500	26,000	26,000	26,800
Premium Standard Farms c/	5,000	5,500	6,000	6,000	6,000	6,000	16,000	16,000	18,000	17,100	17,300
Seaboard d/		1,500	8,000	14,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
Indiana Packers	13,000	13,000	13,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,500
Hatfield Quality Meats	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,200
Clougherty Packing	6,100	6,100	6,100	6,100	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Sara Lee	8,400	8,400	8,400	8,400	8,000	8,000	8,000	8,000	8,000	8,000	6,200
Iowa Packing l/	5,500	5,500	5,500	6,000	6,000	6,000	6,000	6,000	5,000	2,000	2,000
Farmland i/k/	22,000	22,800	28,800	28,800	31,000	31,000	25,500	25,500	28,600		
Lundy	12,000	12,000	12,000	12,000	12,000	12,000					
Thorn Apple Valley/g/	14,500	13,000	15,000	15,000							
Dakota Pork Industries f/	5,800	5,800									
Premium Pork Products	5,000	5,000									
Worthington Packing e/	4,700	4,700									
Fisher Packing	4,400	4,400									
John Morrell a/	30,000										
Tyson b/	6,500										
Total of Major Packers	353,000	360,000	384,000	368,000	363,000	365,000	358,000	353,000	358,000	355,000	367,000
Estimated Industry Total	385,000	390,000	413,000	395,000	388,000	394,000	390,000	388,000	394,000	392,000	407,000

a/ Sold to Smithfield in late 95
 b/ Sold Marshall, MO to Excel fall of 95
 c/ Opened Milan, MO fall of 94, bought Lundy in 00
 d/ Opened Guyton, OK fall of 95
 e/ Down as of 3/96
 f/ Closed August 97
 g/ Closed August 1998
 h/ Rochelle, IL to single shift June 01
 i/ Dubuque, IA sold and closed June 00
 j/ Marshall, MO closed July 01
 k/ Sale to Smithfield Nov 2003
 l/ Changing ownership late 2003

Figure 7

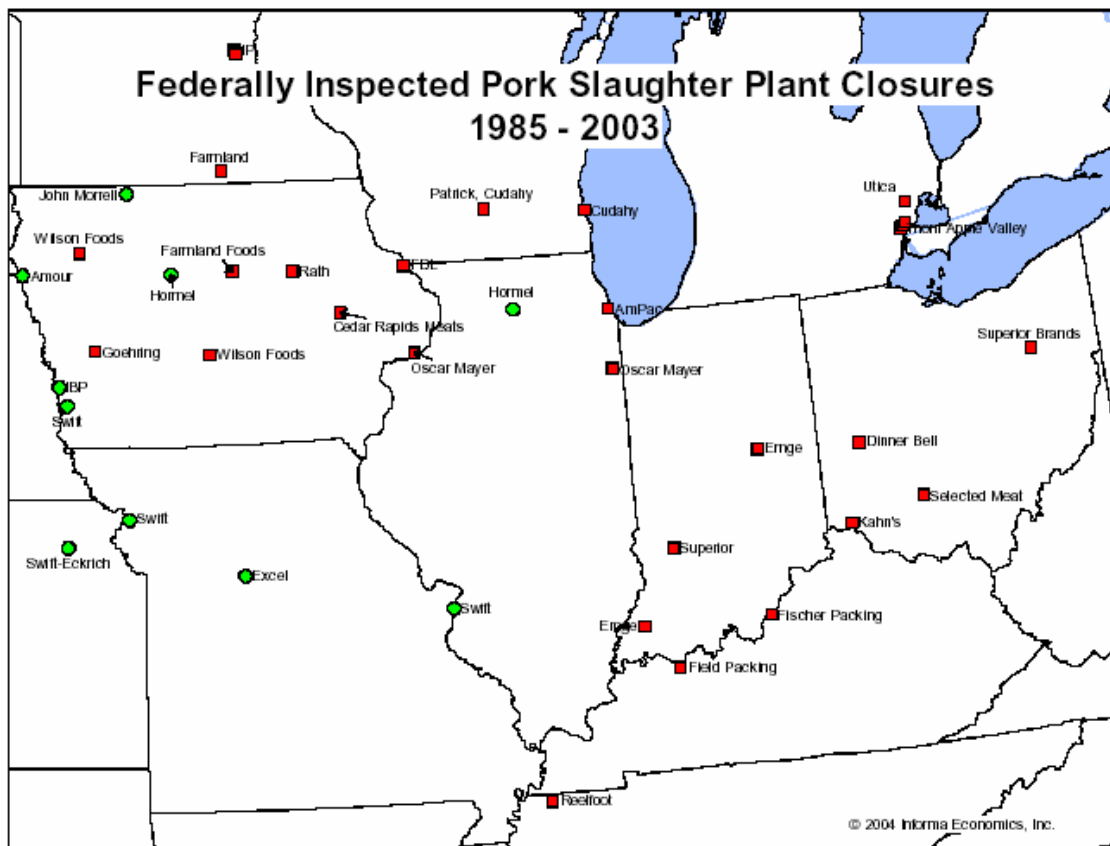


Note: squares denote plants from firms no longer involved in the industry, while circles denote plants from firms still active in the pork industry.

But the amount of change has been much more dramatic among the formerly large group of second tier companies. With only a few exceptions, the category of small to medium-sized single plant companies has ceased to exist. The few that survived are either associated with a producer group, specialized out of barrow and gilt slaughter, or involved in custom killing for other processors. Since 1985, we identify 56 individual federally inspected hog slaughter plants that have ceased operations in the United States, shown above in Figure 7. The majority of these were single plant firms that were pressured out of business by some combination of lack of committed supply, inadequate economies of scale, and continued pressure on margins, as new large-scale double-shifted plants were built by the major firms, including the emerging integrated sector.

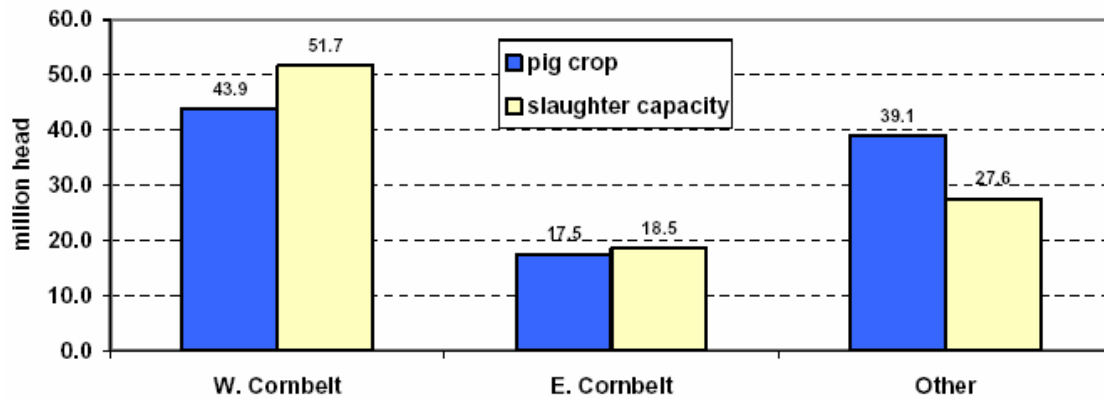
Figure 8 shows that the process of packing capacity consolidation and rationalization was most intense in the Midwest, particularly in Iowa, but also to an important extent in Illinois, Indiana and Ohio. In addition to the permanent exit of many small to medium sized firms, several of the large traditional packers were forced to jettison slaughter capacity as a result of the consistently poor margins prior to 1998. Yet even after all the painful adjustments of the 1980's and 1990's, the Western Cornbelt is still impacted by excess slaughter capacity (Figure 9), suggesting further closures, particularly if slaughter hog production is not maintained at current levels or higher in these states.

Figure 8



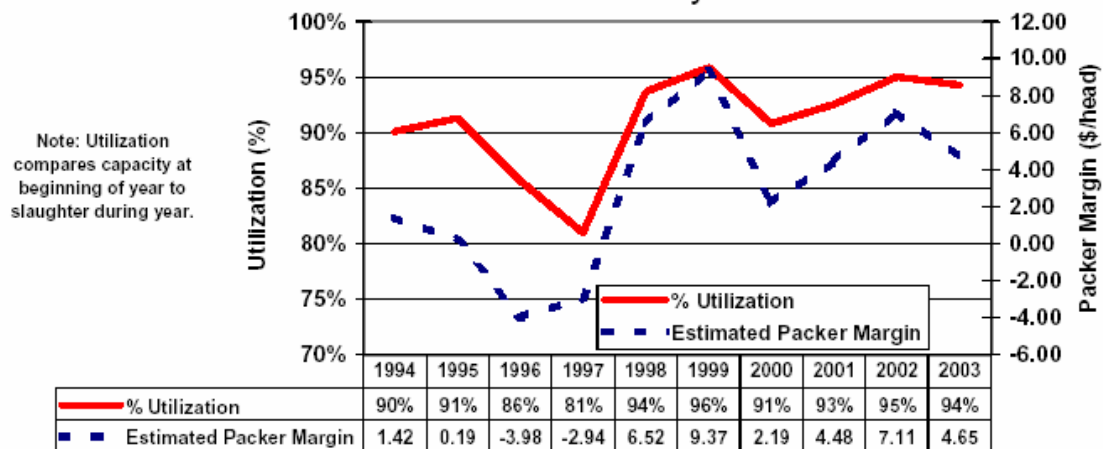
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Figure 9
US Slaughter Capacity Vs Pig Crop, 2003



The key to understanding the intense structural change in the packing sector is capacity utilization. After a prolonged and painful period of underutilization (overcapacity), the industry has emerged with national, if not regional, packing plant capacity roughly in balance with available barrow and gilt supplies (Figures 9 and 10). This balance has been accomplished by a combination of restructuring of both the primary hog production sector and the processing sector. The hog cycle has been tamed to the extent that +/- 10% swings in production, last seen in the 4th quarter of 1998, have been replaced by more modest production changes of 5% or less, with the typical trend being a 2% year-over-year production increase. Packers have lined up supplies, either through contracts, direct ownership, or some combination of the two, in order to keep their current investments running at efficient levels, at least most of the year. Regional balance has been achieved through shifting millions of head of feeder pigs from other states and provinces to the Cornbelt states, to be finished and marketed in that region.

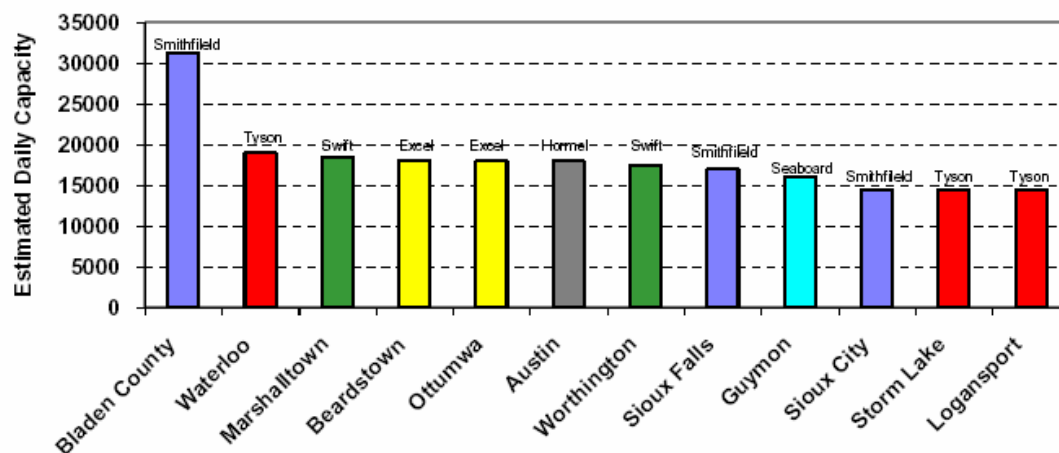
Figure 10
Capacity Utilization and Packer Margins
US Pork Industry



In the future, major new plant investment is unlikely to be built without hog supplies having been secured long before ground is broken for any new packing plant. Even minor capacity improvements will be given careful consideration regarding the availability of adequate supplies. The largest remaining challenge for the industry is to even out the flow of hogs over the course of the year so that plants run closer to capacity all year long. So far the price incentives of much higher spring and summer markets have not been sufficient to allow producers to overcome the biology of hog production, which tends to result in largest kills in late fall and early winter.

The US large-scale, high-throughput model is a unique solution to developing a competitive pork industry that has so far not been duplicated in other major pork producing nations. The modern US packing industry now includes 12 mega-plants of 4 million head or greater annual slaughter capacity, including the largest plant which is capable of slaughtering more than 30,000 head daily, or roughly 8 million per year (Figure 11). The economy of scale advantage of these 12 double-shifted plants is virtually unrivaled; only one plant in Denmark is in the same league in processing capacity. These mega-plants are owned by six different firms and all but two are located in the Midwest.

Figure 11
Top US Pork Plants, 2004



Construction is scheduled for completion in late 2005 for one additional plant of this eventual scale (Triumph Foods), which could alter the US capacity balance significantly. The new plant is a producer-driven initiative to be located on the Southern fringe of the Western Cornbelt at St. Joseph, Missouri. Because the plan is to source hogs from existing hog production facilities, the net effect of this plant would be to create additional demand for slaughter hogs within the region, as existing plants scramble to fill out production lines.

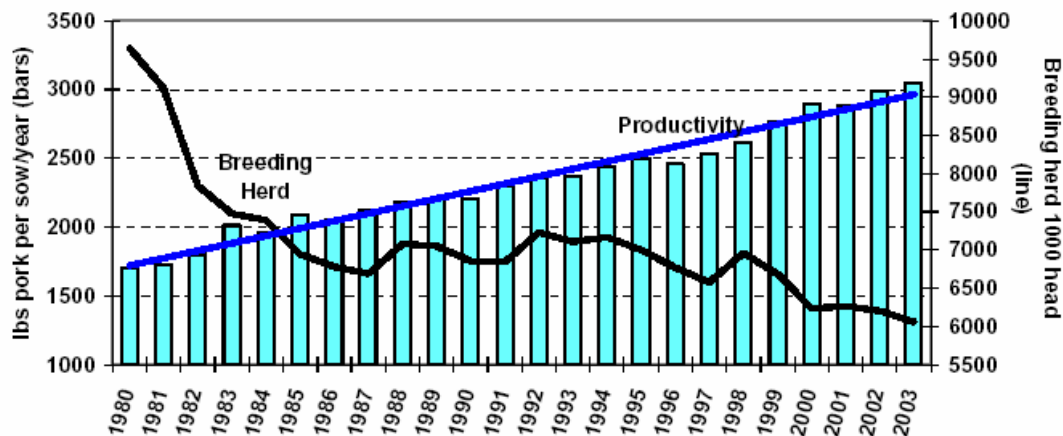
In addition to the 12 mega-plants there are 15 large plants, which in general are assumed to operate at a slightly higher cost structure than the biggest plants and are primarily single shift plants. The group of large plants have capacity to kill about 2 to 4 million head per year. The largest plants in Canada also operate at this scale. If packer margins are pressured by reduced supplies of slaughter hogs or increased slaughter capacity such as is currently the case, many of these second tier plants could eventually be closed, particularly among firms that own more than one facility. It has not been uncommon in recent years for moderate-sized slaughter plants to have been converted to processing plants, while slaughter capacity at other corporate plants was

increased slightly. Still, higher cost plants below the 1.5 million head annual capacity threshold are no longer common, and most survive either as sow kill facilities, producer-owned operations, or other specialty and niche market providers.

Restructuring of the Hog Production Sector

Probably the most comprehensive measure of industry productivity is pork produced per sow (Figure 12). While the US swine breeding herd is almost half the size of what it was in 1980, the amount of pork produced per sow has continued to trend higher, facilitating the upward trend in total industry size and output, despite the decline of the traditional industry measure of breeding herd size. Beyond increasing productivity of US herds, in recent years rising imports of feeder pigs from Canada to be finished and slaughtered in the US has also contributed significantly to the total output of US pork, allowing the industry's long-term growth trend to continue.

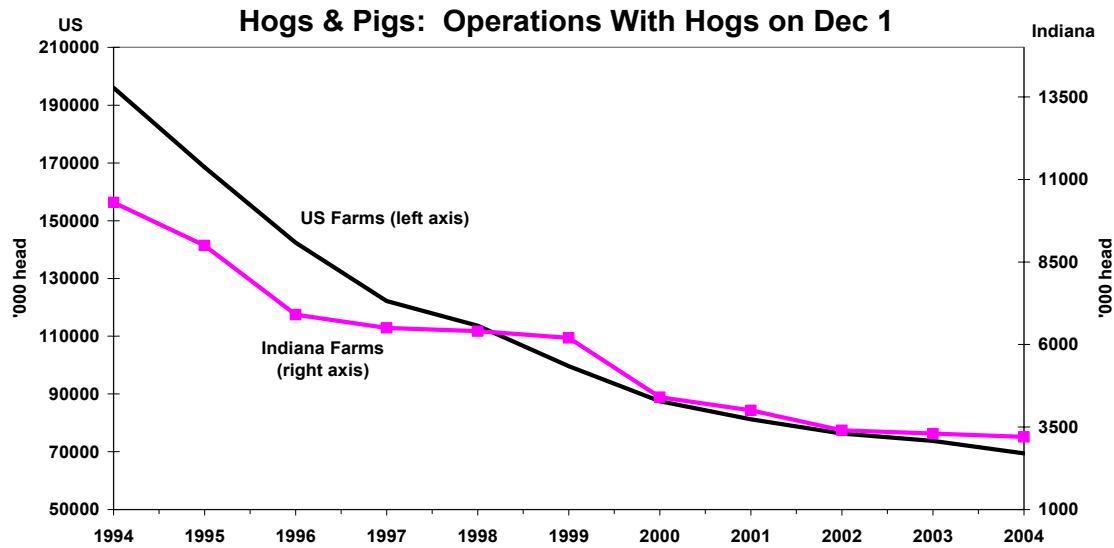
Figure 12
US Pork Produced Annually per Sow vs Dec 1 Breeding Inventory
Note: Not including Canadian-Sourced Pigs



The rising productivity of the hog sector has been driven by several factors—including technological improvements in breeding (genetics), feed efficiency, and herd management—many of which were precipitated (or at least facilitated) by the emergence of highly coordinated supply chains through packer contracting and integration into hog production. The traditional US pork industry—based on tens of thousands of relatively small, independent Midwest producers and dozens of small, largely independent slaughter plants—has proven to be much less efficient at producing consistent quality, low priced pork than the highly coordinated and specialized system of pork production that has emerged especially over the past 20 years. The result has been rapid consolidation of the hog production sector into a relatively small number of massive production units that account for a remarkable share of total US hog production.

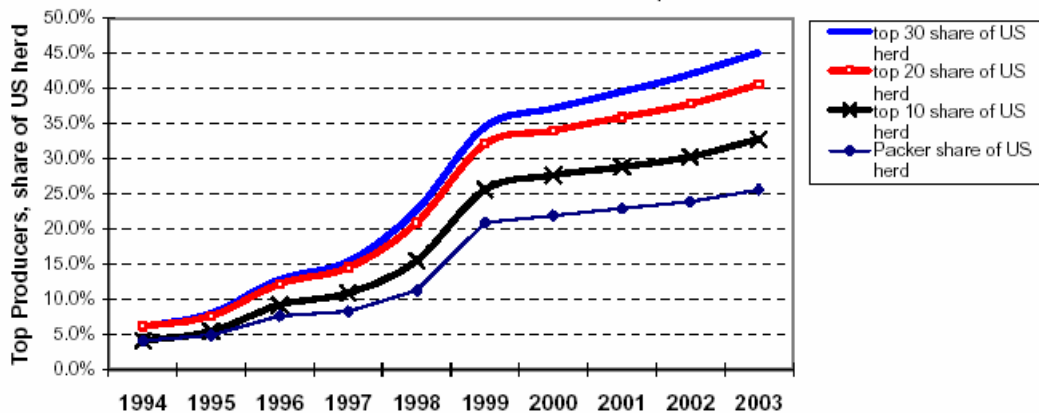
According to the USDA, there were just under 70,000 farms producing hogs as of December 1, 2004. The number of producers has declined steadily over time, with very little fluctuation, at the same time that hogs per farm have increased. Indiana has shown a slower rate of decline in hog operations than the US as a whole, but the result has still been a decline from over 10,000 hog-producing farms in 1994 to only about 3,200 by December 2004 (Figure 13). The rate of loss of operations has slowed since about 2000, but since about 1980 the declining trend has been very consistent and apparently independent of changes in producer margins or any cyclical trends.

Figure 13



Although the USDA may still find tens of thousands of farms across the United States with a few hogs, today's hog industry is far more concentrated than this data would suggest, with only a few hundred operations accounting for an enormous share of total production. In fact, 30 key firms now control more than 45% of the US sow inventory and at least 50% of the production (Figure 14). Ten years ago, these same firms accounted for a little over 5% of US inventories. These firms have successfully achieved a dramatic expansion in sow inventory during a period when the overall US industry was steadily shedding breeding herd capacity and estimated margins for hog production were in a consistent downtrend, combined with a sharp cyclical component. This suggests that it is dangerous to generalize about the financial health of the industry, when some sub sectors are expanding aggressively at the same time as other—mostly small—producers continue to exit the industry.

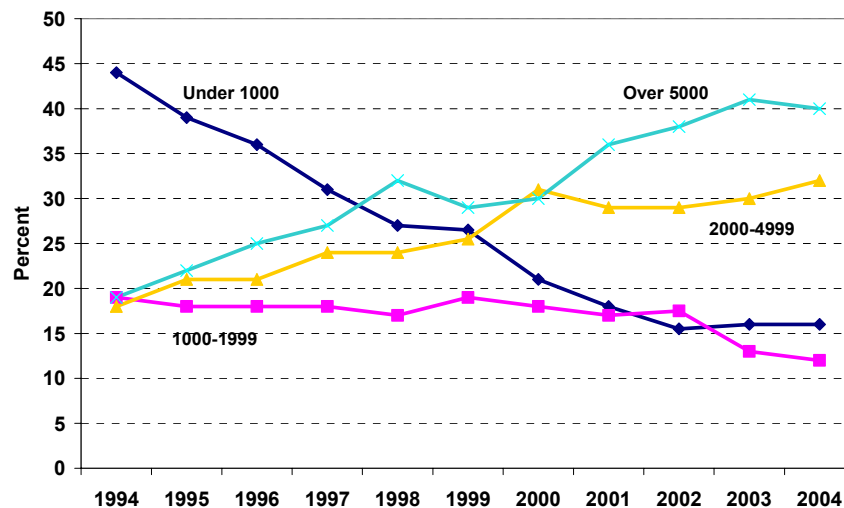
Figure 14
US Top Hog Producers & Share of Sow Herd
 historical trend of 2003 top 30



Breaking down the top 30 producers further, as of 2003, packers owned 25% of the US swine breeding herd, compared to less than 5% as recently as 1994. The top 10 producers, including the largest packer herds, accounted for one third of the US swine herd, and the top 20 firms controlled 40% of the breeding herd. Furthermore, because of higher-than-average productivity, this group is responsible for an even larger share of total US production than their breeding herd share would imply.

The pattern toward fewer, larger hog operations accounting for an increasing share of the hog inventory is persistent across all major states and US regions of pork production, and is unlikely to reverse or even slow considerably in the foreseeable future. In Indiana alone, the proportion of the state's hog inventory held by operations of less than 1,000 head declined from nearly 45% in 1994 to about 16% in 2004, while farms with over 5,000 head increased in their share of total hog inventory from 19% to 40% over the same period (Figure 15). This inventory concentration is highlighted by the fact that over 79% of Indiana hog farms had fewer than 1,000 hogs at the end of 2004, while only about 109 farms (3.4% of all hog farms) with more than 5,000 head account for 40% of the state's hog inventory.

Figure 15
Indiana Hog Inventory by Size of Operation

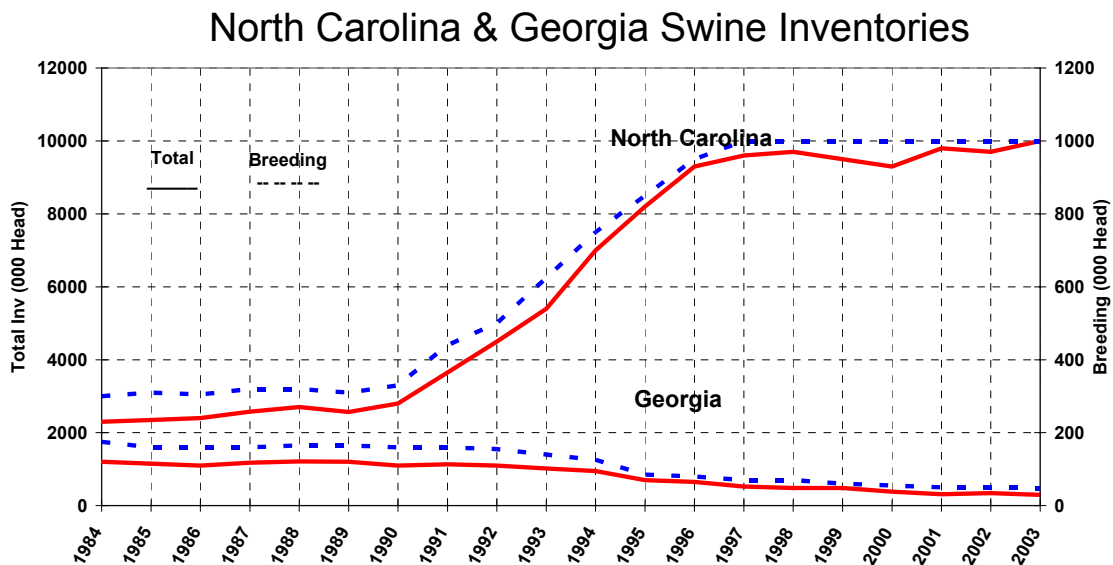


Geographic Production Trends

The rise in prominence in the 1990's of integrated pork firms, with their operations base outside the traditional Cornbelt production area, has changed the geography of hog production dramatically. The most dramatic change occurred in North Carolina, which was transformed in a decade from a relatively minor hog state to the second largest pork producing state in the country. This transformation occurred in spite of a natural disadvantage for the state in terms of feed supplies and costs, compared to states in the Midwest. Key industry players on both the production and processing side developed and refined a highly coordinated production and processing model, with contracting replacing the traditional cash markets for feeder and slaughter hogs found in the Midwest.

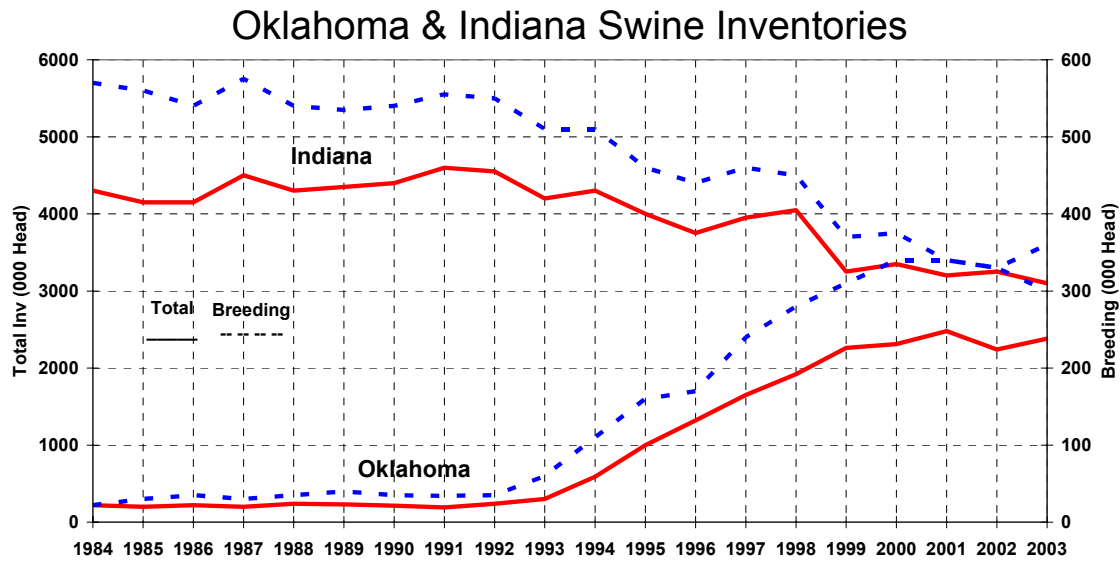
This model has proven extremely successful at producing consistent quality pork at relatively low cost of production, but it also resulted in some adverse externalities, particularly the growing concern over the environmental impact of the massive hog confinement operations and disposing of the waste that they generate. These large confinement operations have also raised the ire of animal rights groups, “family farm” organizations, and some citizens of the local communities where they are based. In North Carolina, a legislative moratorium eventually capped hog inventories, effectively capping regional slaughter capacity as well. Figure 16 shows the dramatic growth of North Carolina swine inventories. In contrast, swine numbers in Georgia, a state with similar climate, culture, and resources, declined steadily as its last major packing plant was closed in 1995, and no new packing plant investment occurred.

Figure 16



Another comparison is shown between Oklahoma and Indiana (Figure 17), with swine inventories trending in opposite directions since 1992, before leveling off at very similar-sized industries by 2003. As a Cornbelt state, Indiana would appear to have an advantage for hog production from a feed cost perspective, but Oklahoma and other Western states have been the chosen location of many of the most recent large hog production operations, perhaps due to the relatively arid climate and low population densities which mitigate some of the environmental considerations and public opposition likely in traditional hog states. Nebraska shows a very similar pattern in hog inventories to that of Indiana, with the reduction there likely exacerbated by that state’s extremely restrictive family farm legislation that actively discouraged investment by commercial players, which also spurred the growth in nearby Oklahoma. Western Oklahoma was the site for the last major new pork packing plant to be built in the US. An important observation is that inventory trends in the US are far from homogenous, with some states still growing and others losing inventory rapidly. Furthermore, the behavior of key firms and state legislation has been more important than natural resources in determining whether a regional industry will expand or contract.

Figure 17



With the rise of the integrated pork producer and extensive adoption of contractual linkages between packers and their suppliers, specialization in pork production has also increased, with a corresponding decline in the role of the modest sized, farrow-to-finish hog operation that has characterized Midwest hog production for much of the last century into the mid 1990's. Along with an overall decline in the US sow base that reflects increasing productivity of the existing breeding herd, there has been a dramatic shift in the location of the sow base away from the traditional Midwest states. The number of sows in Nebraska, Iowa, Illinois and Ohio has decreased by roughly one-third over the last ten years, while Indiana's sow base has declined by over 40% (Table 2). At the same time, North Carolina and Oklahoma have shown tremendous expansion, while Colorado and Utah have also emerged to become important hog states.

The top firms with the largest sow base have demonstrated dramatic growth and success during a period of increasing competition and downward-trending margins for primary production. An interesting example of this growth is Smithfield Foods, which has emerged in less than 10 years to become the nation's largest hog producer with over 808,000 sows in 2004, more than 3 times its next largest competitor (ContiGroup/PSF). Following the 1998 and 1999 hog glut and price meltdown, Smithfield acted on the opportunity to buy several of its largest hog suppliers, in the process becoming the world's largest grower of hogs. No longer involved only in the pork industry nor operating solely in the United States, the development of this firm has nonetheless been central to the dramatic changes that have swept the US pork industry.

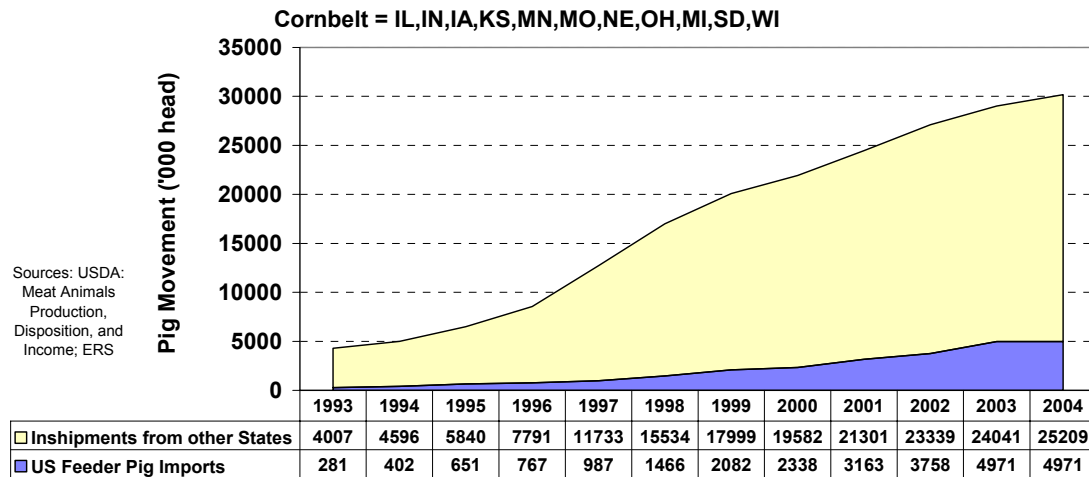
In the future, we would expect this process of growth and consolidation among the top producers to continue, with continued sow base consolidation and the transfer of production assets from firm to firm, combined with modest internal growth. While the list of top players 10 years from now could be substantially different from today's list, it is almost a given that the new Top 10 and Top 30 will control a substantially larger share of the total US hog production sector.

**Table 2 - Analysis of US Sow Herd Location
1994-2004, '000 head on December 1**

Declining Sow States						
State	Peak #	Peak Year	1994	Peak - 1994 % Decline	2004	1994-2004 % Decline
Iowa	1800	1991	1500	-17%	1070	-29%
Illinois	740	1991	620	-16%	420	-32%
Nebraska	580	1992	530	-9%	355	-33%
Indiana	575	1987	510	-11%	290	-43%
Ohio	295	1988	215	-27%	155	-28%
S. Dakota	260	1991	210	-19%	140	-33%
Michigan	185	1987	160	-14%	110	-31%
Georgia	175	1984	125	-29%	42	-66%
Wisconsin	189	1984	150	-21%	50	-67%
Kentucky	155	1988	100	-35%	40	-60%
Tennessee	150	1988	75	-50%	23	-69%
Total	3304		2695	-18%	1625	-40%
Increasing Sow States						
State	Low #	Low Year	1994	Low - 1994 % Increase	2004	1994-2004 % Increase
N. Carolina	300	1984	750	150%	1020	36%
Oklahoma	22	1984	110	400%	360	227%
Colorado	20	1984	110	450%	140	27%
Texas	65	1985	70	8%	100	43%
Utah	3	1986	14	367%	92	557%
Mississippi	18	1993	23	28%	35	52%
Total	428		1077	152%	1747	62%
Swing Sow States						
State	1984	Low Year	1994	1984-1994 % Change	2004	1994-2004 % Change
Kansas	200	1999	155	-23%	155	0%
Minnesota	540	1985	550	2%	600	9%
Missouri	470	1989	460	-2%	340	-26%
Pennsylvania	90	1985	115	28%	115	0%
Arkansas	57	1984	110	93%	85	-23%
Total	1357		1390	2%	1295	-7%

As the breeding herd has and will continue to consolidate into fewer firms of enormous scale, the Midwest maintains an important role in the finishing stage of production, especially to serve its still significant packing and processing sector. The result has been a dramatic increase in hog inshipments to the Midwest where producers—often under contract with the region's packers—feed them through to slaughter weight (Figure 18).

Figure 18
Sources of Pig Flow into Cornbelt



The pattern of hog inshipments into Indiana mirrors the rest of the Cornbelt, with imports of feeder pigs having grown by a factor of more than 5 over the past 10 years as more farmers focus on the finishing stage of hog production. In 2004, the volume of hog inshipments accounted for 46% of Indiana's December 1 hog inventory, down from 53% in 2003 but still consistent with a long-term increasing trend (Figure 18). North Carolina has emerged to become a major supplier of hogs to Indiana, and while inshipments from this state decreased in 2004 for the first time in over ten years, it still remains the largest supplier even while inshipments from other states continue to grow (Figure 19).

Figure 18
Indiana Hog Inshipments

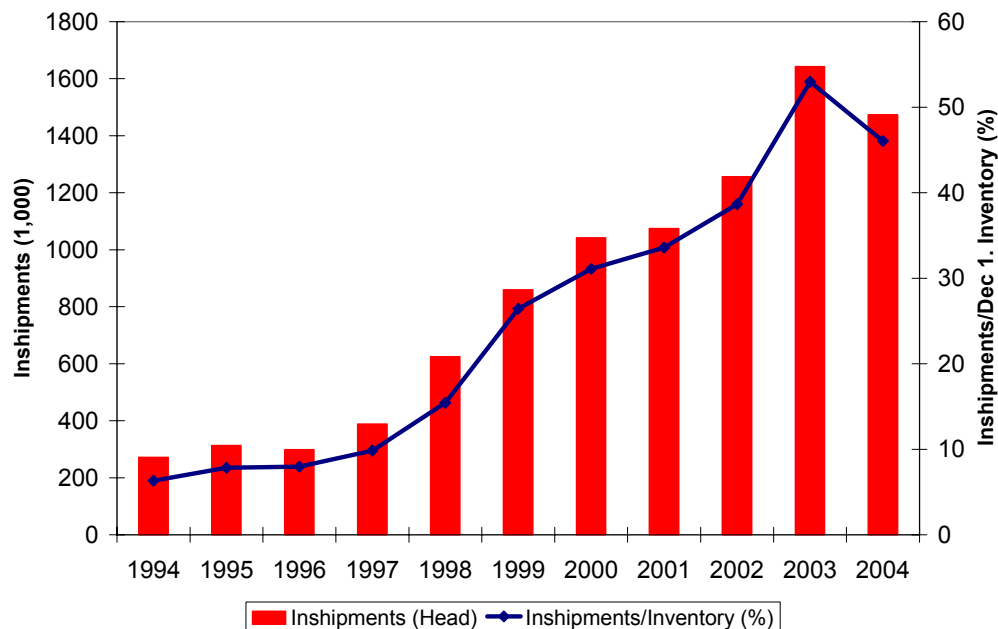
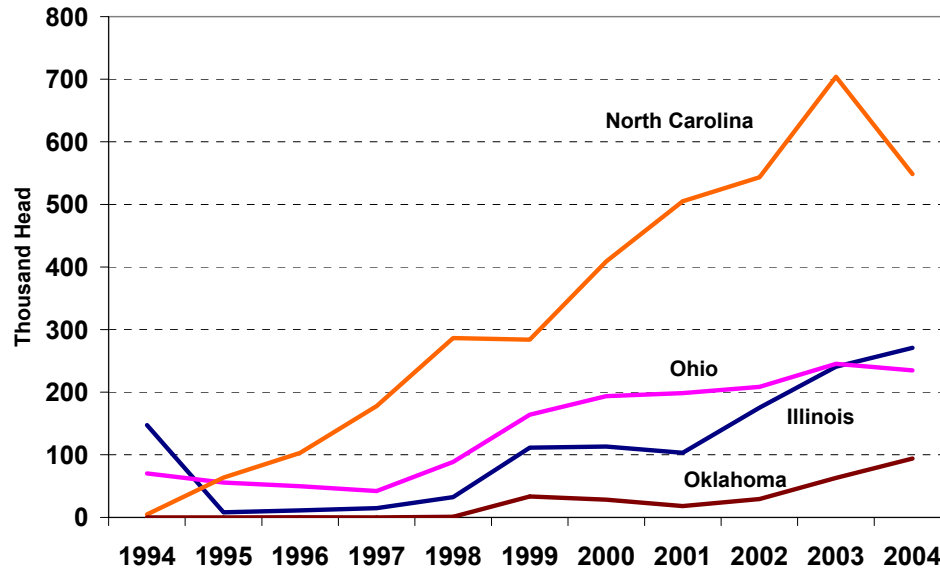


Figure 19
Indiana Hog Inshipments: Major Sources



The Role of the Independent Producer

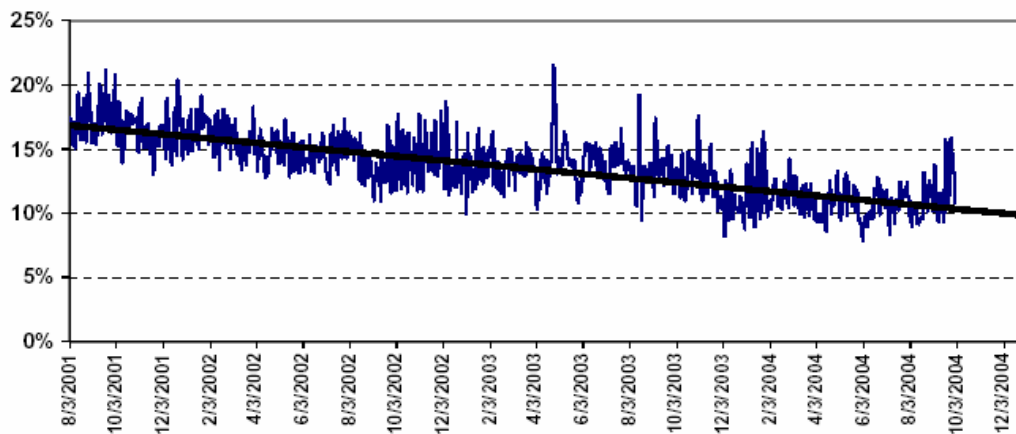
Often-cited important advantages of integrated production include improved coordination of slaughter and reduced purchasing costs, increased uniformity of product, and the natural hedge resulting from slaughter margins tending to be best during periods of low hog prices and vice versa. The benefits of streamlining plant operations through an owned supply of hogs are considerable, compared to the old system of buying hogs from buying stations or worse yet, terminal markets. The advantages of uniform high quality genetics for pork marketing and enhanced competition with the other meats are substantial as well. However, to a large degree, many of these benefits can also be achieved by long term contracts with independent producers (preferably large enough to supply at least a truckload of hogs per week or more), which often dictate everything from genetics to pricing and delivery of the hogs. However, from the packer's standpoint there is still a risk that during a period of overcapacity, another packer could entice away contracted hogs by offering more favorable terms to the independent producer, something which would not happen to directly owned supplies.

The truly independent producer, who holds no packer contract of any kind and sells his hogs by negotiated sale, certainly represented the large majority of output 25 years ago but today operates as a smaller player in the US pork industry. Today, negotiated sales account for 10% of slaughter volumes and this share will continue to decline as the primarily small producers that market in this fashion exit the industry (Figure 20).

Survival of the independent producer now tends to be predicated on the ability to provide large volumes of hogs to packers under tight quality specifications. The traditional 200 sow or smaller farrow-finish producer in the Midwest is no longer a significant factor in the industry, with most

having either left the industry or adapted by feeding out pigs brought in from outside their geographic region. About one quarter of the national sow herd is now owned directly by packers. Although by definition an independent producer holds no significant ownership by a processing firm, most of these farms nevertheless are tied contractually to specific packers, and many have delivered hogs to the same plant for their entire existence. As pork packers sell their products into a highly competitive domestic and export market, the need to coordinate from genetics all the way up to pork marketing is critical. Therefore the term “independent” applies more to ownership than to operation of these firms. Unlike the small, truly independent producers who have largely become marginalized from the new pork industry, modern independent hog producers still play an important role, supplying about two thirds of current slaughter hog marketings.

Figure 20
Negotiated Share of Daily Hog Purchases



Commercial independent producers are likely to continue to figure prominently, particularly in the Midwest, where non-integrated packers still struggle to line up slaughter supplies. This is an important distinction from the broiler industry, where the simplicity of production and smaller capital investment for production was instrumental in eliminating the independent grower within a relatively short period of time. But the remaining independent hog producers face competitive pressures passed down from the end markets for pork as well as the competitive pressure from other hog operations located both in the United States and Canada. If individual operators do not achieve continuous improvement in their productivity or cost structure and fall behind for even a year or two, they are likely to end up as casualties of the restructuring process, with other firms operating their assets. That said, many of the top independent producers can still achieve efficiencies and margins surpassing the hog production systems owned by packers, having mastered a management-intensive production process that requires doing many small things right, particularly at the farrowing level.

In addition to successfully managing a complex process, including controlling costly disease outbreaks, there are certain key size hurdles that are important to the long term success of an independent farrow-finish hog operation. The lowest of these size hurdles, about 600 sows, ensures sufficient production to market one truckload of slaughter hogs per week given typical production efficiencies. Producers below this size limit are unlikely to secure a long term marketing contract with a packer, and therefore are likely relegated to the less attractive spot

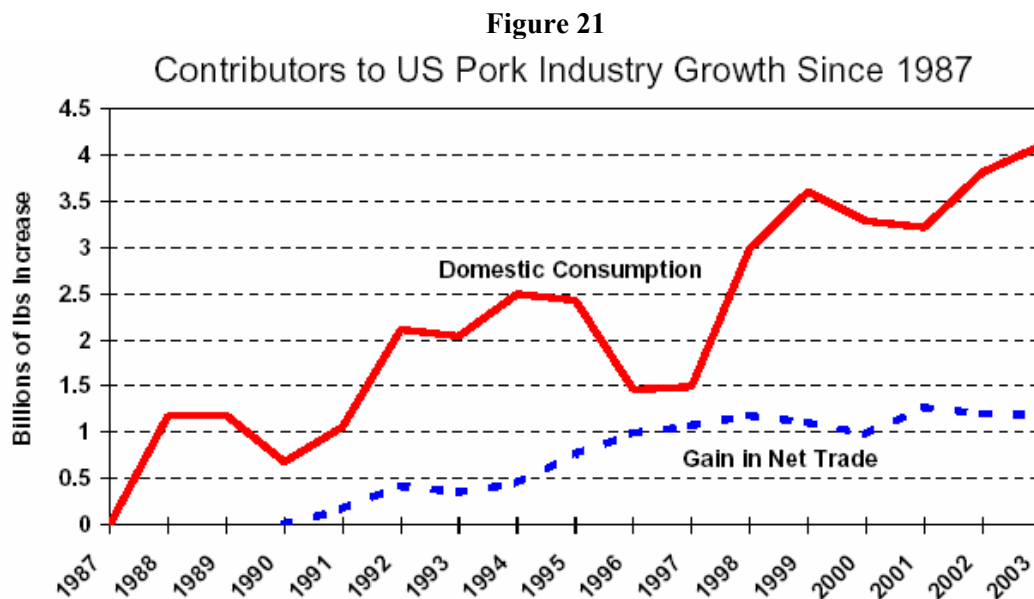
market. Considering that the average Midwest producer 25 years ago was a farrow-finish unit of 200 sows or smaller, utilizing part-time farm labor, the impact of this first size hurdle on market structure has been enormous. Remaining small producers in the Midwest are now mostly involved in finishing out feeder pigs, either on a contractual basis for one of the larger producers, or independently often using feeder pigs brought in from outside the region, including Canada. Operating a finishing barn involves lower investment than farrow-finish, as well as less labor, lower risk, and less management expertise, making these operations a better fit for farms involved in grain production as well as livestock.

Challenges for the Future

The US pork industry has been largely re-invented in the last 25 years, in response to constant competitive pressures both internal and external. The packing sector has shed dozens of firms, with 11 key companies having emerged out of the intense restructuring. Similarly, the production side has been distilled down from tens of thousands of small producers to about 30 key firms and several hundred additional significant players. The traditional 200 sow or smaller farrow-finish producer in the Midwest is no longer a significant factor in the industry, with most having either left the industry or adapted by feeding out pigs brought in from outside their geographic region. About one quarter of the national sow herd is now owned directly by packers. Through this entire period of often-painful adjustment, two main accomplishments of the industry stand out:

- Through constant productivity improvement as well as increased live imports, the industry has captured a steady share of the growing US population's meat consumption.
- The industry has developed a strong competitive position in world markets, with exports growing every year since 1990.

Together these two elements have resulted in the considerable growth the industry has seen since 1987 (Figure 21).



Looking ahead, the US pork industry faces several important challenges as it continues the process of restructuring in the coming years, with important implications for the future growth patterns and structure of the US pork industry. Many of these challenges could require substantial investments in research and education, and some will require difficult policy or regulatory decisions at the local, state and even national level. Hence, decisions made and policies adopted at various levels of government will play a significant role in the pork industry's future, affecting not only national trends but also which states and regions will benefit from these trends.

Indiana has identified a strategic goal to double hog production by 2025. The first step to meeting this goal will require coordinated efforts at the state and local levels to foster a business environment conducive to meeting the challenges identified below.

Challenge 1: Hold Pork's Share in Domestic Market

The static per capita demand for pork over the past several decades (highlighted earlier in this report) suggests that it will be very difficult to grow per capita pork consumption beyond current levels without a dramatic reduction of price. However, prices like those experienced in 1998/1999 would not be financially sustainable over the long run for even the most efficient operators. A realistic goal is to continue to hold pork's share of the domestic protein market at least steady, while looking for opportunities to grow demand. For example, the industry will need to strike a balance among flavor, leanness, and versatility attributes, noting that some items such as bellies have seen exceptional demand in recent years, while other pork cuts such as loins have demonstrated a clear decline in demand.

Changing demographics of the marketplace will also have implications for long term pork demand. USDA/ERS recently reported that among major US ethnic groups, Blacks consume 63 pounds of pork per person per year, Whites 49 pounds, and Hispanics consume the least pork at 45 pounds per capita. And, over the next two decades, the Hispanic population will claim a much larger share of the US population, while growth in the White population will slow; suggesting that current demographic trends could pull US per capita consumption lower in the years ahead.

The USDA report also found that higher income individuals tend to consume less pork, as do elderly consumers, two factors which also portend future challenges for the pork industry. And, nearly 80% of all pork is purchased at retail stores for home consumption, while food-away-from-home has been one of the fastest growing segments of overall food expenditures, including competing meats. Taken together, all of these market and demographic factors suggest that without a proactive strategy to grow demand, pork consumption could stagnate or even decline in the years ahead.

While lower consumer prices could increase overall pork consumption, attention should also focus on strategies to increase pork's appeal among new and existing consumers. Some research has shown that recent efforts to decrease the fat content of pork may have gone too far by sacrificing some of the texture and flavor characteristics consumers expect, suggesting future research into breeding and genetics should place a renewed emphasis on flavor and other consumer characteristics.

The industry should also watch for opportunities in niche markets, including organic production, systems that emphasize animal welfare considerations, and heirloom varieties that might appeal to certain consumer segments. While these markets might be small and have higher production

costs, they can provide profitable opportunities for some producers and also help to grow demand among the higher income segments of the population.

Challenge 2: Regain Momentum in Net Trade

Although pork exports have grown for 15 consecutive years, and 2005 could show strong gains as well, much of the growth in the last few years reflects exceptional circumstances, such as restricted US exports of beef (due to the discovery of BSE). Further trade liberalization of key markets like Japan would benefit the US pork industry, but also benefit the industries in export competitors like Canada, Denmark, and Brazil. Export markets will be strongly contested in the years to come, with intense competition in both quality and price. Shocks such as disease outbreaks and trade disputes will add volatility to the export component of demand. This suggests, at a minimum, a strong emphasis on free trade policies at the federal level is needed, along with rigorous systems to protect against the introduction and spread of animal diseases that could reduce confidence in the US pork supply or promote sanitary/phyto-sanitary trade disputes.

Challenge 3: Keep the Packing Industry Running near Capacity

A high volume efficient slaughter and processing sector is one of the principle strengths of the US pork industry. The largest failure of the traditional pork industry of 25 years ago was the inability to coordinate hog supply and match it to available slaughter capacity and pork demand, resulting in alternating periods of excess supply/low prices and tight supply/high prices on both a seasonal (annual) and cyclical (approximately four year) basis. The new, more efficient processing industry has much less flexibility and reserve capacity built in, making it imperative that a better job is done of matching production to slaughter capacity. If there is insufficient capacity, prices will turn disastrously low as they did in 1998; an adjustment mechanism to be sure, albeit a highly painful one for producers.

On the other hand, if the pendulum swings too far in the direction of excess capacity, which could be an emerging trend given recent interest in new and expanded plants, packer margins will suffer and further painful adjustments will follow in that industry. Once net packing capacity is lost in the future, it will not be regained unless there is an equivalent increase in hog production directly committed to the new plant, meaning that the overall size of the US pork industry would likely shrink.

The integrated production companies have invested heavily in hog production capability to effectively solve the capacity problem, although like the rest of the industry they continue to tackle the problem of seasonality of production. Most of the highly integrated production systems are located outside of the traditional Cornbelt production area, but much of the Cornbelt still has a large excess in packing capacity compared to the region's pig crop. Fortunately, the region also has a huge surplus in feedgrain production and a large number of producers, independent and contractors, who are interested in taking pigs from outside the region and feeding them through to slaughter weight, to be marketed to the region's packers. If this flow were sharply curtailed for some reason, plant efficiency would immediately decline and permanent plant closures would probably result.

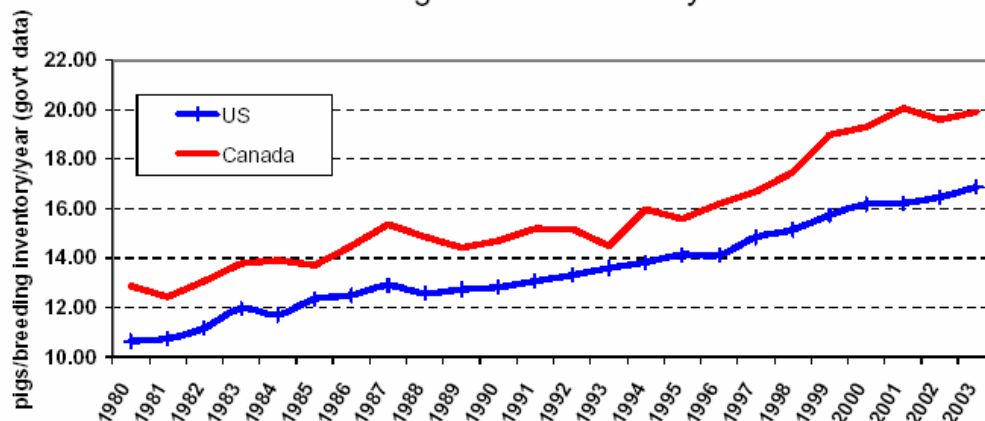
Challenge 4: Improve Farrowing Efficiency

For the last 25 years the main engine for productivity improvement in the US hog production sector has been structural change. Small, inefficient, single site, and part time farrow-finish units have been replaced by larger, multi-site dedicated units, with much higher productivities.

Structural change has now progressed so far that the contribution of traditional small producers to total output is very small, probably less than 10%. To make further gains it will be necessary to improve productivity in all units, including existing commercial operations, which do not appear to have made major improvements as a group.

It appears that the strengths of the US pork industry are in the finishing stage of production as well as the packing and processing sector. The United States has demonstrated a consistent competitive disadvantage to Canada in breeding herd productivity, measured by pigs weaned per breeding animal per year (Figure 22). Both countries have made large improvements in their breeding herd efficiencies in the past 25 years, but the gap has persisted, and even widened in recent years. While there may be differences in management styles between the United States and Canada, the ready exchange of people and ideas, and similar production systems makes a persistent gap seem less likely. Similarly, the productivity gap cannot be explained by macro-economic effects such as the Canada/US exchange rate, which has varied widely over the same period. One of the more plausible theories is that a relatively low hog density, cool climate, and better-insulated barns have resulted in consistently lower disease status and improved performance at the farrowing level in Canada. Historically, the climatic necessity of higher investment in barns may have encouraged more intensive management systems with full-time owner managers, compared to the traditional US model where part-time producers were common.

Figure 22
Breeding Herd Productivity



Challenge 5: Improve Environmental Perception of Hog Farming

The rapid structural change that has occurred throughout the livestock industry, but particularly in the swine sector, has contributed to intense regulatory pressure as large, confined animal production systems have emerged as a dominant feature of modern livestock systems. Much of this pressure begins at the local level, where residents in the proximity of large confinement operations raise objections based on environmental considerations (water and air pollution), odors, and quality of life issues. Some of the concerns are real, and based on isolated instances where environmental damage has occurred from either accidental release of animal waste or negligent management by individual operators. But some of the public pressures on modern livestock facilities are unfounded, and fueled by sophisticated public interest groups adept at using the media to promote fear among local residents and consumers regarding the safety and long-term sustainability of modern livestock production systems. These pressures can result in a range of

actions taken at the state and local levels to discourage expansion of the livestock industry, including everything from zoning restrictions and setback requirements to prohibitively onerous permitting requirements and even outright moratoria on the expansion of new or existing livestock operations.

The modern hog sector has proven to be extremely mobile, and willing to locate even outside of the major sources of feed supply if there are offsetting benefits in terms of greater vertical control of the production process, reduced labor costs, or perhaps reduced regulatory burdens. This mobility is not limited to within the United States, as Canada, Mexico, Brazil, and other overseas locations could provide attractive options for future expansion by major US hog producers.

While basic economic considerations have played a major role in the restructuring of the hog sector over the last decade, environmental concerns have also factored into the equation, and could explain some of the recent industry expansion into more arid, less populated regions of the United States. Most all states are currently struggling to find the best way to regulate livestock production without necessarily stifling economic activity. The challenge is to create flexible policies that will allow for regions, watersheds and counties to accommodate their special circumstances and needs while still providing a reasonable set of standards and rigorous enforcement to minimize the threat of contamination. This is especially important today, since concentration of the hog production sector means that the site location decisions by any of the major firms can have enormous consequences for the size of the hog inventory in any particular state.

This also suggests a need for basic research into techniques to mitigate the real and potential environmental consequences of hog production, including ways to reduce or eliminate odors and the threat of ground water, surface water and air pollution. Innovative research could also focus on improved management systems that might appeal to public concerns about animal welfare without raising production costs, and alternative uses for livestock waste such as energy generation. Improvements in the perception of modern hog production systems among the general public, achieved by reducing or eliminating the primary sources of animosity, could provide significant leverage for Indiana, with its vast grain resources, to reemerge as a major source of future hog industry growth.